

REMARKS

The amendment regarding “synthesizing a double-strand molecule” in the independent claims is supported by Figures 1 and 9 and the descriptions associated with these figures, for example, see paragraphs [0088] to [0090]. The amendment of claims 45-48 is supported by paragraph [0039].

Claims 13-15 were rejected under 35 USC 112, second paragraph. This rejection is respectfully traversed and should be withdrawn in light of this Amendment.

Claims 1-7 were rejected as being anticipated by Kneipp. This rejection is respectfully traversed.

Kneipp relates to “a method for sequencing at least a portion of DNA or RNA is provided. DNA or RNA is cleaved into fragments and each fragment is allowed to become individually adsorbed onto a rough aggregate-bearing metal surface or a plurality of aggregates.” See paragraph [0063] of Kneipp. Kneipp fails to disclose “synthesizing a double-strand molecule comprising the separated purine base or pyrimidine base and a single strand target molecule on the SERS substrate” as recited in claim 1.

Claims 8-12 and 16-23 were rejected as being obvious over Kneipp in view of Liang.

Both Kneipp and Liang *as a whole* fail to disclose “synthesizing a double-strand molecule comprising the separated purine base or pyrimidine base and a single strand target molecule on the SERS substrate” of claim 1 or “synthesizing a double-strand molecule comprising a complimentary purine base or pyrimidine base and the single strand target molecule on the SERS substrate” of claim 16.

Claims 13-15 were rejected as being obvious over Kneipp in view of Vo-Dinh. This rejection is respectfully traversed.

Both Kneipp and Vo Dinh *as a whole* fail to disclose “synthesizing a double-strand molecule comprising the separated purine base or pyrimidine base and a single strand target molecule on the SERS substrate” of claim 1.

Claims 24-28, 30-37, 39-40 and 43-44 were rejected as being obvious over Williams in view of Kneipp, further in view of Vo-Dinh. This rejection is respectfully traversed.

Williams in view of Kneipp, further in view of Vo-Dinh *as a whole* do not teach or suggest “synthesizing a double-strand molecule comprising the first nucleotide and the single strand nucleic acid” as recited in claim 24 and “synthesizing a double-strand molecule comprising the first nucleotide and the single strand template nucleic acid” as recited in claim 34.

Claim 29 has been rejected as being obvious over Williams in view of Kneipp, further in view of Vo-Dinh and Liang. This rejection is respectfully traversed.

Claim 29 depends from claim 24. Liang does not fill the gaps in claim 24, mentioned above.

Claim 38 has been rejected as being obvious over Williams in view of Kneipp, further in view of Vo-Dinh and Quake. This rejection is respectfully traversed.

Claim 38 depends from claim 34. Quake does not fill the gaps in claim 34, mentioned above.

Claims 24-26, 28, 30-35 and 41-44 were rejected as being obvious over Xue in view of Kneipp, further in view of Vo-Dinh. This rejection is respectfully traversed.

The Examiner has acknowledged that Xue teaches fluorescent detection rather than SERS detection. The Examiner then relies on Kneipp and Vo-Dinh and argues that the “teachings of Kneipp and Vo-Dinh would have motivated the person of ordinary skill in the art to *incorporate SERS detection into the fluorescence-based sequencing of Xue.*” See page 15, lines 15-17, of the

Action; emphasis added. Applicants respectfully submit that this statement appears to be based on hindsight gained from the present invention, rather than from any evidence in the cited references.

One of the novel features of the present invention is that it does *not* necessarily require labeling as in the current techniques such as that of Xue, which requires fluorescent labels. The method of the embodiments of the invention can perform sequencing of DNA by synthesizing a double-strand DNA molecule from a single strand target DNA molecule and observing the differential concentration of nucleotides before and after the DNA synthesis by means of surface enhanced Raman spectroscopy (SERS). As the determination of the DNA sequence can be done simply by observing the differential concentration of nucleotides before and after the DNA synthesis by means of surface enhanced Raman spectroscopy (SERS), it is not necessary to require labeling as in the method of Xue, which can substantially reduce the cost of sequencing.

In short, as the method of the present invention does *not* necessarily require labeling, the Examiner statement that “the person of ordinary skill in the art ... [would have been motivated to] *incorporate SERS detection into the fluorescence-based sequencing of Xue*” is rather unscientific and does not provide a legitimate basis for motivation to combine the cited references. Why would persons of ordinary skill in the art incorporate SERS detection into *the* fluorescence-based sequencing of Xue when fluorescence-based sequencing already provides sequence information? Also, why would a person of ordinary skill in the art combine SERS detection with the fluorescence-based sequencing of Xue when no labels are necessarily required by the method of the present invention, whereas the combination would mean substantially more complexity and cost?

Claim 29 is rejected as being obvious over Xue in view of Kneipp, further in view of Vo-Dinh and Liang. This rejection is respectfully traversed.

Claim 29 depends from claim 24. Liang does not fill the gaps in claim 24, mentioned above.

Claims 1-44 were provisionally rejected for same invention double patenting over claims 1-44 of co-pending Application No. 11/020,776; claims 1-2, 4 and 13 were provisionally rejected

for obviousness-type double patenting over claims 1, 6, 9 and 12 of co-pending Application No. 10/108,128; claims 1-2, 4 and 13 were provisionally rejected for obviousness-type double patenting over claims 1, 6-7 and 17-18 of co-pending Application No. 10/660,902; and claims 1-2 and 4 were provisionally rejected for obviousness-type double patenting over claims 17, 20-21 and 24 of co-pending Application No. 11/255,386; and claims 1-2, 4, 5-6, 9-10 and 12 were provisionally rejected for obviousness-type double patenting over claims 1, 6, 9 and 12 of co-pending Application No. 11/270,211.

As these rejections are *provisional* rejections, Applicants are not required to respond to overcome these rejections at this time of the prosecution.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 070702007100.

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